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SUBJECT: ROMANIA: NUCLEAR POWER SECTOR ON THE RISE

REF: A) State 127468, B) Bucharest 595

SUMMARY

¶1. Nuclear power accounts for an increasing share of Romania's electricity production. The country's two operating reactors at the Cernavoda Nuclear Power Plant currently provide 18 percent of Romania's domestic electricity production, with this number scheduled to double after two additional reactors planned for the same site are completed. When combined with Romania's large hydroelectric power base, more than half of Romania's current electrical power generation is carbon-free. The Government of Romania (GOR) plans to expand the use of nuclear power in order to meet increasingly aggressive EU carbon emissions targets. Romania is largely able to operate and fuel its nuclear reactors without outside assistance, but will use foreign companies to provide a secondary source of nuclear fuel and to design and supervise the construction of new reactors. This report responds to Department's ref A request for information about the nuclear power sector. END SUMMARY.

NUCLEAR GENERATION TODAY

¶2. Romania has been operating nuclear reactors for power generation since December 1996, when the first reactor at the Cernavoda nuclear power plant came on line. The Cernavoda site, located on the Danube River 150 km east of Bucharest, was initially conceived by the former communist regime as the location for up to five nuclear reactors, of which four will ultimately be built. A Canadian design, the Canada Deuterium Uranium (CANDU-6) pressurized heavy water reactor (PHWR) using natural uranium, was selected for use in the power complex. Reactor 1 was built in cooperation with Atomic Energy of Canada Ltd. (AECL) and Ansaldo (a company of the Italian Finmeccanica Group). General Electric (GE) provided the turbine, the generator, and the fuel loading machines.

¶3. Romania's second nuclear reactor at Cernavoda began operations on May 6, 2007, and was fully connected to the power grid on October 1, 2007. The second unit is also a PHWR CANDU reactor, built by the same joint venture between AECL and Ansaldo, with GE providing additional components. Today both reactors are operating at full capacity with reliability records placing them in the top tier of CANDU operators. On a recent visit to Cernavoda, EconOff met both the professional managers and the competent technical staff working for the state-owned nuclear power company, Nuclearelectrica. While only a few expatriates are currently employed by Nuclearelectrica, additional foreign consultants and project managers will be needed to assist in the construction of reactors 3 and 4. Many of the employees have benefited from foreign training, mostly in the U.S. or Canada. The company is able to provide sufficient salary and benefits to attract and retain a high quality workforce domestically.

¶4. With two reactors now on line, the operating efficiency of the complex has improved, helping to ensure baseload stability on the Romanian electrical grid. Following commissioning of the second reactor, Nuclearelectrica became the second-biggest electric power provider in Romania (hydroelectric producer Hidroelectrica is bigger), with nuclear power covering 18 percent of Romania's domestic electricity consumption. Nuclearelectrica has been a profitable contributor to the state budget, earning the equivalent of 37 million USD in the first half of 2008.

WHY NUCLEAR POWER?

¶5. The GOR decided in 2007 to construct two additional reactors in Cernavoda, in part to help Romania meet aggressive EU climate change targets. This project, designed as a public-private partnership, has been subject to lengthy delays, with the GOR making a last-minute decision (only after accepting bids for the project) to increase the government's stake in the consortium to 51 percent. A lengthy negotiating process finally resulted in an agreement on November 20, 2008 between the Government and the six private companies involved. The new agreement puts Nuclearelectrica firmly in charge, with a 51 percent stake, while Czech CEZ, French GDF SUEZ, Italian Enel and German RWE each hold 9.15 percent. The remaining shares, of 6.2 percent each, belong to Spanish Iberdola and the Romanian division of Arcelor-Mittal. The 4 billion euro project is scheduled to be completed in 2015, with Nuclearelectrica contributing the government's share through loans, retained earnings and in-kind contributions. Each of the two new units will be able to produce 720 MW of electricity. The 1500 RPM turbine, to be delivered by GE, will be among the biggest steam turbines ever built.

¶6. Romanian policymakers clearly see nuclear energy as a source of

energy security for Romania. Even as plans are just being finalized for reactors three and four, the GOR has already floated the idea of building additional reactors elsewhere in Romania, probably in Transylvania (a feasibility study is planned for summer 2009). This proposed facility would be completed after 2020, host between two and four reactors, and have a total output of up to 2,400 MW.

¶7. Nuclear energy is attractive, in part, thanks to Romania's ability to generate nuclear fuel domestically. Using a research reactor operating near Pitesti and locally mined uranium ore, the GOR is able to produce up to 10,000 fuel bundles each year, enough to supply both existing Cernavoda reactors (reftel B). After use, the radioactive assemblies are stored in a 49,250 rod capacity cooling pond at the Cernavoda site. Once cooled, low- and medium-level radioactive waste is usually moved to a permanent, 21,000-drum capacity storage facility located inside of a retired uranium mine in Baita Bihor. High-level waste is being kept on site in a temporary storage facility until the permanent high-level waste repository being built in Saligny, near Cernavoda, is completed in ¶2014.

¶8. With Romania holding enough natural uranium deposits to last for 30 to 50 years at current usage levels, as well as possessing a domestically-designed heavy water plant and a large-capacity, temporary radioactive waste storage facility, nuclear power production here is largely a domestic affair. While additional reactors will most likely outpace the GOR's ability to mine and manufacture sufficient quantities of nuclear fuel, the GOR would prefer importing nuclear fuel from western suppliers to generating electricity through increased natural gas imports from Russia. Post fully expects that any new reactors built in Romania will be of a western design.

¶9. A secondary interest in nuclear power stems from efforts to meet EU climate change targets. With four reactors, nuclear power production will provide nearly a third of Romania's growing electricity demand. Coupled with the existing hydroelectric capacity, which accounts for almost a third of power production, Romania is well on the path to meeting increasingly aggressive carbon reduction targets. This large and expanding carbon-free production base opens the door to future electricity exports to the

rest of the EU.

GOVERNMENT ACTORS

¶10. While Cernavoda is managed by Nuclearelectrica, other entities play leading roles in Romania's nuclear sector. Inspections and enforcement are the responsibility of the National Commission for Nuclear Activities Control (CNCAN), an independent nuclear regulator directly subordinated to the Prime Minister. CNCAN also enforces the nuclear liability law, which makes the operator exclusively responsible for a nuclear accident, and verifies that nuclear operators are sufficiently indemnified against potential losses. The Nuclear Agency, under the Ministry of Economy and Finance, sets the overall policy direction for the GOR with regard to nuclear power. Other smaller players assist with nuclear research and manage radioactive waste disposal.

TRADE OUTLOOK

¶11. The expansion of the nuclear industry in Romania is likely to generate new business opportunities for U.S. companies in the areas of: engineering design, construction and project management, supply of specialized equipment (turbines, valves, gauges, control equipment, safety and detection systems), waste management, security, and safety. Among the American companies with appropriate expertise and technology that have expressed interest in the Romanian market are American Ecology Corporation, Babcock and Wilcox, Bechtel Nuclear, CH2M Hill, Crane Nuclear, GE, Shaw Group, and URS Corporation.

COMMENT

¶12. Romania has a developed nuclear power base which it will continue to expand. Energy security concerns, climate change targets, and rising demand all argue for an increased focus on building new nuclear power plants. The GOR is able to manage operations and run reactors using domestic labor and expertise. However, there is no indigenous company with the capability to design and supervise the construction of world-class reactors, meaning that the GOR will continue to form partnerships with foreign firms, such as that for reactors 3 and 4, if it hopes to build additional plants. While there is a long history of cooperation with Canadian nuclear experts, the GOR would be open to any western technology, preferring to avoid deeper nuclear energy ties to Russia. As Russia is the sole supplier of imported natural gas and

a major oil supplier, further dependence on Russia in the nuclear sector would do nothing to advance Romania's energy security goals. End Comment.

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